

IN THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1(Currently Amended). A method of testing an integrated circuit (IC) containing a transmit path and a receive path, said method comprising:

connecting said transmit path of said IC to a receive path of a calibrated IC, and said receive path of said IC to a transmit path of said calibrated IC, wherein said IC is provided in the form of a stand-alone die;

transmitting a first signal from said IC to said calibrated IC on said transmit path of said IC;

receiving said first signal in said calibrated IC; and

examining said first signal in said calibrated IC to determine whether to discard/qualify said IC,

~~wherein the cost to test said IC is minimized due to testing in the form of said die.~~

2(Original). method of claim 1, wherein said IC comprises a mixed signal IC and said calibrated IC is also of mixed signal form, said method further comprising:

converting a first digital data element to an analog signal, wherein said first signal comprises said analog signal, and wherein said analog signal is transmitted on said transmit path of said IC.

3(Original). The method of claim 2, wherein said mixed signal IC is connected to said calibrated IC by a probe pad, wherein said probe pad connects a signal lead of said transmit path of said mixed signal IC to a signal lead of said receive path of said calibrated signal IC.

4(Currently Amended). The method of claim 2, further comprising:

converting another digital data element to another analog signal;

transmitting said another analog signal from said calibrated IC to said mixed signal IC;
and

examining said another analog signal in said mixed signal IC to determine whether to discard/qualify said mixed signal IC.

5(Original). A method of testing a mixed signal integrated circuit (IC), said method comprising:

converting a digital data element to an analog signal in said mixed signal IC;

transmitting said analog signal to said calibrated IC;

receiving said analog signal in said calibrated IC; and

examining said analog signal in said calibrated IC to measure a deviation of a signal level of said analog signal from a signal level corresponding to said digital data element,

wherein a decision to discard/qualify said mixed signal IC is based on said deviation.

6(Original). The method of claim 5, wherein said mixed signal IC is tested in the form of a stand-alone die, wherein a probe pad connects a transmit path of said mixed signal IC to a receive path of said calibrated IC, and a receive path of said mixed signal IC to a transmit path of said calibrated IC.

7(Original). The method of claim 5, wherein said mixed signal IC is designed to operate with a plurality of valid symbols contained in a constellation table, wherein each of said plurality of valid symbols contains a plurality of vector components, said method further comprising:

generating in said mixed signal IC each of a plurality of baseband signals by converting a corresponding sequence of vector components, wherein said sequence of vector components comprise said digital data element, wherein corresponding vector components form a transmitted symbol;

modulating each of said plurality of baseband signals with a corresponding one of a plurality of carrier signals to generate a corresponding one of a plurality of modulated signals, wherein each of said plurality of baseband signals are phase-shifted at least by some degree with respect to each other; and

combining in said mixed signal IC said plurality of modulated signals to generate said analog signal transmitted to said calibrated IC.

8(Original). The method of claim 7, further comprising:

demodulating in said calibrated IC, said analog signal using a corresponding one of said carrier signals to generate a corresponding one of a plurality of demodulated signals;

converting each of said plurality of demodulated signals into a corresponding sequence of vector components, wherein corresponding vector components form a vector combination;

determining said deviation based on each of said vector combinations and a corresponding valid symbol.

9(Original). The method of claim 8, wherein said determining comprises:

receiving vector components corresponding to said transmitted symbol, wherein said corresponding valid symbol comprises said transmitted symbol; and

computing said deviation based on a vector distance between said transmitted symbol and said vector combination corresponding to said transmitted symbol.

10(Original). The method of claim 8, wherein said determining comprises:

finding a closest valid symbol to said vector combination, wherein said corresponding valid symbol comprises said closest valid symbol; and

computing said deviation based on a vector distance between said vector combination and said closest valid symbol.

11(Original). The method of claim 8, wherein said deviation is determined based on 802.11a wire-less standard.

12(Original). The method of claim 8, wherein each of said symbols contain only two vector components.

13(Currently Amended). A mixed signal integrated circuit (IC) containing a built-in-self-test capability, said mixed signal IC comprising:

a receiver block receiving an analog signal, said analog signal being generated externally by converting a digital data element; and

a computation block examining said analog signal to measure a deviation of a signal level of said analog signal from a signal level corresponding to said digital data element, wherein a decision to discard/qualify said mixed signal IC is based on said deviation[[-]],
said mixed signal IC is designed to operate with a plurality of valid symbols contained in a constellation table, wherein each of said plurality of valid symbols contains a plurality of vector components, and
said computation block comprising a error vector magnitude (EVM) computation block,
said EVM computation block determining said deviation based on each of said vector combinations and a corresponding valid symbol.

14(Currently Amended). The mixed signal IC of claim 13, ~~wherein said mixed signal IC is designed to operate with a plurality of valid symbols contained in a constellation table, wherein each of said plurality of valid symbols contains a plurality of vector components;~~ said mixed signal IC further comprising a transmitter block, wherein said transmitter block comprises:

a plurality of digital-to-analog convertors generating each of a plurality of baseband signals by converting a corresponding sequence of vector components, wherein corresponding vector components form a transmitted symbol;

a plurality of up-conversion mixers modulating each of said plurality of baseband signals with a corresponding one of a plurality of carrier signals to generate a corresponding one of a plurality of modulated signals, wherein each of said plurality of baseband signals are phase-shifted at least by some degree with respect to each other; and

an adder combining said plurality of modulated signals to generate another analog signal.

15(Currently Amended). The mixed signal IC of claim 13, wherein said receiver block comprises:

a plurality of down-conversion mixers demodulating said analog signal using a corresponding one of a carrier signals to generate a corresponding one of a plurality of demodulated signals;

a plurality of analog-to-digital convertors converting each of said plurality of demodulated signals into a corresponding sequence of vector components, wherein corresponding vector components form a vector combination;

~~— said computation block comprising a error vector magnitude (EVM) computation block, said EVM computation block determining said deviation based on each of said vector combinations and a corresponding valid symbol.~~

16(Original). The mixed signal IC of claim 15, wherein said EVM computation block receives vector components corresponding to a transmitted symbol based on which said analog signal is formed, said EVM computation block computing said deviation based on a vector distance between said transmitted symbol and said vector combination corresponding to said transmitted symbol.

17(Original). The mixed signal IC of claim 15, wherein EVM computation block finds a closest valid symbol to said vector combination, wherein said corresponding valid symbol comprises said closest valid symbol, said EVM computation block computing said deviation based on a vector distance between said vector combination and said closest valid symbol.

18(Original). The mixed signal IC of claim 15, wherein said deviation is determined based on 802.11a wire-less standard.

19(Currently Amended). A mixed signal integrated circuit (IC) containing a built-in-self-test capability, said mixed signal IC comprising:

means for receiving an analog signal, said analog signal being generated externally by converting a digital data element; and

means for measuring a deviation of a signal level of said analog signal from a signal level corresponding to said digital data element, wherein

a decision to discard/qualify said mixed signal IC is based on said deviation[[:-]] ,

said mixed signal IC is designed to operate with a plurality of valid symbols contained in

a constellation table, wherein each of said plurality of valid symbols contains a

plurality of vector components, and

said means for measuring a deviation comprising means for computing error vector

magnitude (EVM), said means for computing EVM determining said deviation

based on each of said vector combinations and a corresponding valid symbol.

20(Original). The apparatus of claim 19, wherein said mixed signal IC is designed to operate with a plurality of valid symbols contained in a constellation table, wherein each of said plurality of valid symbols contains a plurality of vector components, wherein said means for receiving is operable to:

demodulate said analog signal using a corresponding one of a carrier signals to generate a corresponding one of a plurality of demodulated signals; and

convert each of said plurality of demodulated signals into a corresponding sequence of vector components, wherein corresponding vector components form a vector combination,

wherein said means for measuring computes said deviation based on each of said vector combinations and a corresponding valid symbol.

21(Original). The mixed signal IC of claim 20, wherein said means for measuring receives vector components corresponding to a transmitted symbol based on which said analog signal is formed, said means for measuring computing said deviation based on a vector distance between said transmitted symbol and said vector combination corresponding to said transmitted symbol.

22(Original). The mixed signal IC of claim 20, wherein means for measuring finds a closest valid symbol to said vector combination, wherein said corresponding valid symbol comprises said closest valid symbol, said means for measuring computing said deviation based on a vector distance between said vector combination and said closest valid symbol.

23(Original). A device comprising:

a processing block; and

a mixed signal integrated circuit (IC) containing a built-in-self-test capability, said mixed signal IC comprising:

a receiver block receiving an analog signal, said analog signal being generated externally by converting a digital data element; and

a computation block examining said analog signal to measure a deviation of a signal level of said analog signal from a signal level corresponding to said digital data element,

wherein a decision to discard/qualify said mixed signal IC is based on said deviation.

24(Original). The device of claim 23, wherein said mixed signal IC is designed to operate with a plurality of valid symbols contained in a constellation table, wherein each of said plurality of valid symbols contains a plurality of vector components, said mixed signal IC further comprising a transmitter block, wherein said transmitter block comprises:

a plurality of digital-to-analog convertors generating each of a plurality of baseband signals by converting a corresponding sequence of vector components, wherein corresponding vector components form a transmitted symbol;

a plurality of up-conversion mixers modulating each of said plurality of baseband signals with a corresponding one of a plurality of carrier signals to generate a corresponding one of a plurality of modulated signals, wherein each of said plurality of baseband signals are phase-shifted at least by some degree with respect to each other; and

an adder combining said plurality of modulated signals to generate another analog signal.

25(Original). The device of claim 23, wherein said receiver block comprises:

a plurality of down-conversion mixers demodulating said analog signal using a corresponding one of a carrier signals to generate a corresponding one of a plurality of demodulated signals; and

a plurality of analog-to-digital convertors converting each of said plurality of demodulated signals into a corresponding sequence of vector components, wherein corresponding vector components form a vector combination,

said computation block comprising an error vector magnitude (EVM) computation block, said EVM computation block determining said deviation based on each of said vector combinations and a corresponding valid symbol.

26(Original). The device of claim 25, wherein said EVM computation block receives vector components corresponding to a transmitted symbol based on which said analog signal is formed, said EVM computation block computing said deviation based on a vector distance between said transmitted symbol and said vector combination corresponding to said transmitted symbol.

27(Original). The device of claim 25, wherein EVM computation block finds a closest valid symbol to said vector combination, wherein said corresponding valid symbol comprises said closest valid symbol, said EVM computation block computing said deviation based on a vector distance between said vector combination and said closest valid symbol.